

CLAIMS

We Claim:

1. A method, comprising;
forming trenches along the scribe lines on a semiconductor wafer;
applying a mechanical pressure to the semiconductor wafer; and
singulating individual die on the wafer by applying the mechanical pressure to the wafer.
2. The method of claim 1, further comprising etching the wafer to form the trenches along the scribe lines.
3. The method of claim 2, wherein the etching is either a plasma etch or a wet etch.
4. The method of claim 1, further comprising partially cutting the wafer using a saw along the scribe lines to a desired depth to form the trenches.
5. The method of claim 1, wherein forming the trenches along the scribe lines further comprises:
applying a photo resist layer over the active surface of the wafer;
patterning the photo resist layer to form open regions running the length of the scribe lines on the wafer; and
etching the wafer to form the trenches in the wafer as defined by the open regions.
6. The method of claim 1, further comprising applying tape onto the non-active surface of the wafer.
7. The method of claim 1, wherein the applying a mechanical pressure to the semiconductor wafer further comprises:
(i) placing the active surface of the wafer onto a pad; and
(ii) applying the mechanical pressure onto the back surface of the wafer.
8. The method of claim 7, wherein applying the mechanical pressure is done along the direction of the scribe lines on the wafer.
9. The method of claim 7, wherein applying the mechanical pressure is done in a circular motion on the back surface of the wafer.

10. The method of claim 1, further comprising back-grinding the wafer to reduce its thickness prior to applying pressure to the wafer.
11. The method of claim 1, wherein the trenches have a depth approximately fifty percent or less of the thickness of the wafer.
12. The method of claim 1, wherein the trenches have a depth approximately fifty percent or more of the thickness of the wafer.
13. The method of claim 1, wherein the trenches have a depth of 300 microns or less.
14. The method of claim 1, wherein the trenches have a depth of 200 microns or less.
15. The method of claim 1, wherein the trenches have a depth of .00 microns or less.
16. An apparatus comprising:
 - a pad for supporting a semiconductor wafer;
 - a positioning member to position the semiconductor wafer on the pad; and
 - a pressure mechanism to apply a mechanical pressure to the wafer so as to singulate the individual die on the wafer.
17. The apparatus of claim 16, wherein the pad is a resilient pad.
18. The apparatus of claim 16, wherein the positioning member is a ring configured to substantially fit around the circumference of the wafer.
19. The apparatus of claim 16, wherein the pressure mechanism comprises, but is not limited to, one of the following: a roller, a blade, or a squeegee.
20. The apparatus of claim 16 wherein the pressure mechanism is configured to apply pressure in the direction of the scribe lines on the wafer.
21. The apparatus of claim 16 wherein the pressure mechanism is configured to apply pressure in a circular motion on the wafer.